

TB(1B) Ch. 10 Introduction to Coordinates Conventional Questions

1. [16-17 Standardized Test, #5]

In **Figure 1**, it is given that $A(5, 60^\circ)$ and $B(6, 150^\circ)$ are two points in the polar coordinate plane and O is the pole.

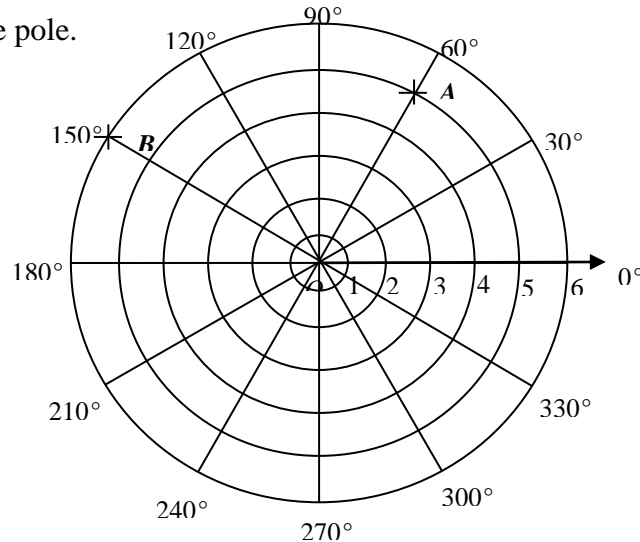


Figure 1

- (a) Plot $C(4, 240^\circ)$ on the given polar coordinate plane. **(1 mark)**
- (b) Write down the length of AC . **(1 mark)**
- (c) Find the area of $\triangle ABC$. **(1 mark)**

2. [16-17 Standardized Test, #8]

The coordinates of A are $(-5, -2)$. A is translated to the right by 12 units to B .

- (a) Write down the coordinates of B . **(1 mark)**
- (b) It is given that the y -coordinate of C is 8.
 - (i) Find the area of $\triangle ABC$. **(3 marks)**
 - (ii) If C is translated downwards by n units, find the possible value(s) of n such that the area of triangle is decreased by 40%. **(3 marks)**

3. [16-17 Final Exam, #13]

$A(-4, -8)$ is a point on the rectangular coordinate plane. A is first rotated anti-clockwise about the origin through 90° and then translated 10 units to the left to B . B is then reflected about the x -axis to C .

(a) Write down the coordinates of B and C . (2 marks)

(b) L is a straight line parallel to the y -axis and cuts the x -axis at $(k, 0)$, where k is a positive number. It is given that $\triangle ABC$ is reflected about the line L to $\triangle A'B'C'$.

(i) Write down the coordinates of A' in terms of k . (1 mark)

(ii) It is given that $AA'C'C$ is a trapezium. If the area of $AA'C'C$ is 144 sq. units, find the value of k . (2 marks)

(Hint: You can use **Figure 5** to help you in this question.)

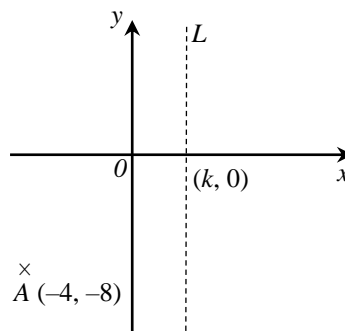


Figure 5

4. [17-18 Final Exam, #6]

In **Figure 3**, O is the origin and the coordinates of A are $(9, 3)$. If B is formed by reflecting A about y -axis and C is formed by rotating A through 90° clockwise about O .

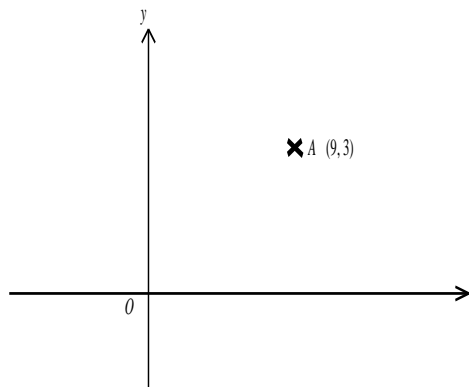


Figure 3

(a) Write down the coordinates of B and C . (2 marks)

(b) Find the area of $\triangle ABC$. (2 marks)

5. [17-18 Final Exam, #14]

- (a) Figure 10(a) shows a rectangle $ABCD$. Prove that the area of the rectangle is 50 square units.

(3 marks)

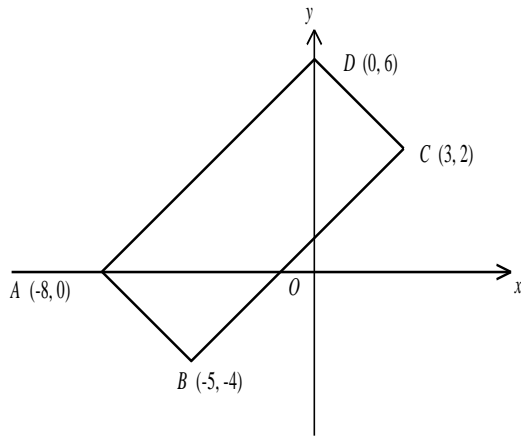


Figure 10(a)

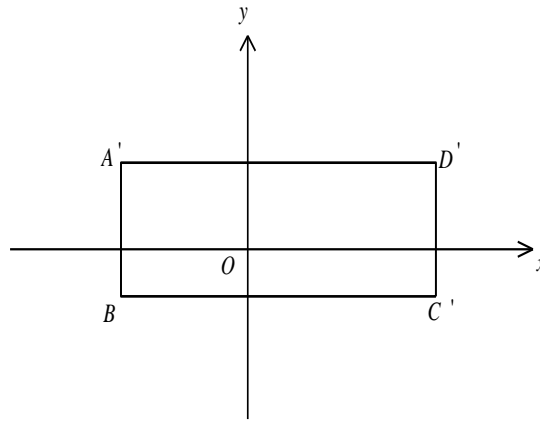


Figure 10(b)

- (b) The rectangle $ABCD$ is rotated about B to a position $A'BC'D'$ as shown in Figure 10(b) such that BC' is parallel to the x -axis. If $A'B = 5$ units, find the coordinates of D' .

(1 mark)

6. [18-19 Final Exam, #14]

In Figure 8, the coordinates of P and Q are $(10, 7)$ and $(10, -4)$ respectively. L is a line parallel to the y -axis and cuts the x -axis at $(k, 0)$. Q is reflected about line L to R . It is given that the x -coordinate of R and the y -coordinate of R are equal.

- (a) Write down the length of PQ . (1 mark)

- (b) Find the value of k . (2 marks)

- (c) R is translated upwards by 5 units and then rotated clockwise about the origin through 90° to S .

T is a point lying on the horizontal line passing through S such that the length of $ST = 6$ units.

Melanie claims that the area of quadrilateral $PQRT$ must always be smaller than 73 sq. units.

Do you agree with her? Explain your answer. (Level 3) (3 marks)

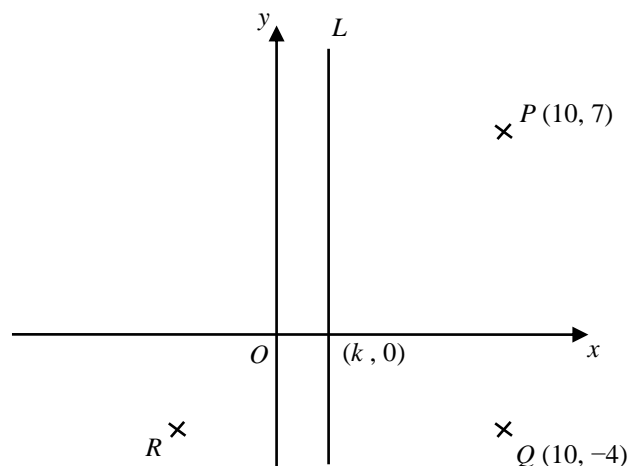


Figure 8

7. [20-21 Final Exam, #7]

Refer to **Figure 1**,

- (a) Write down the coordinates of the point of intersection of the straight lines L_1 and L_2 (1 mark)
- (b) If the point of intersection is rotated anti-clockwise about the origin through 90° to P , write down the coordinates of P . (1 mark)

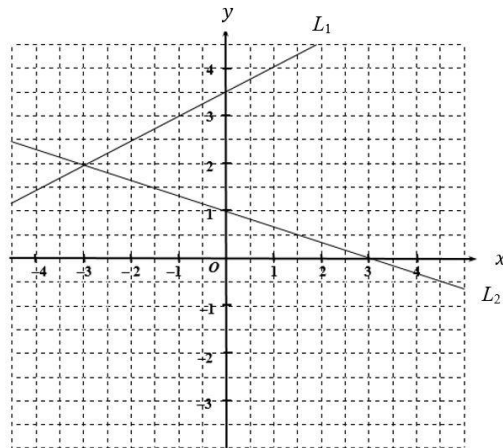
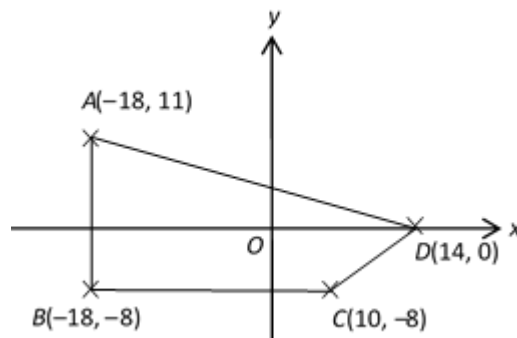


Figure 1

8. [20-21 Final Exam, #17]

$A(-18, 11)$, $B(-18, -8)$, $C(10, -8)$ and $D(14, 0)$ are four points in a rectangular coordinate plane as shown in **Figure 7**.

- (a) Find the area of the quadrilateral $ABCD$. (3 marks)
- (b) If D is translated upward to point E such that $ABCE$ becomes a trapezium, write down the coordinates of E . (1 mark)



9. [20-21 Final Exam, #22]

The coordinates of A , B and C are $(-5k, 5k)$, $(-5k, -4k)$ and $(2k, k)$ respectively where k is a positive number.

(a) Show that the area of $\triangle ABC$ is $31.5k^2$ sq. units. **(2 marks)**

(b) It is given that L is a line passing through the point $(-4k, 0)$ and parallel to the y -axis. A and B is reflected with respect to L to E and F respectively. C is rotated clockwise about the origin through 90° to G . Someone claims that the area of $\triangle ABC$ is larger than the area of $\triangle EFG$ by 75%. Do you agree? Explain your answer.

(4 marks)

Level 3

~ End ~